

Cholinium-Based Ionic Liquids with Acetate and Metilsulfonate Anions: Synthesis and Thermophysical Characterization

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Ionic liquids based on the cholinium cation (trimethyl-hydroxyethylammonium) have been investigated as possible environmentally friendly alternatives to conventional ionic liquids in distinct research fields. Nevertheless, most of the ionic liquids based on the cholinium cation show higher melting points than those of common alkyl-imidazolium based ionic liquids. To overcome this problem, new families of ionic liquids inspired on alkyl-dimethyl-hydroxyethylammonium, with the alkyl chain length ranging from C₂ to C₅ were tested. Acetate and metilsulfonate anions were chosen to maintain the biocompatibility level of these ionic liquids (although the increased chain lengths of the cations may lead to other toxicity issues) and to reflect the latest trends on ionic liquids research. Density and viscosity data for alkyl-dimethyl-hydroxyethylammonium-based ionic liquids (n=1,2,3,4,5) combined with acetate or metilsulfonate anion were measured at atmosphere pressure in the temperature range 283 K (melting point, if higher) to 363 K (decomposition temperature, if lower). Isobaric thermal expansion coefficients were derived from the density data available. The fundamental aim of this work is to characterize this new family of ionic liquids with melting temperatures below room temperature. Molecular Dynamics simulations were used to interpret the experimental data.